

## ABSTRACT

A temperature averaging thermal sensor is implemented in an integrated circuit such as a microprocessor. The temperature averaging thermal sensor monitors the temperature of the integrated circuit in a plurality of different locations across the integrated circuit, calculates an average temperature and generates an output to indicate that the average temperature of the integrated circuit has attained a pre-programmed threshold temperature. In a microprocessor implementation, the microprocessor contains a plurality of thermal sensors each placed in one of a plurality of different locations across the integrated circuit and an averaging mechanism to calculate an average temperature from the plurality of thermal sensors. Sense circuitry reads the programmable input values and generates an interrupt when the temperature of the microprocessor reaches a threshold temperature. In addition to a temperature averaging thermal sensor, the microprocessor contains halt logic that halts operation of the microprocessor when the temperature attains a critical temperature.

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